

Exhibit C



Manual Chapter : Creating Custom Classifications

Applies To:

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BIG-IP PEM

11.6.5, 11.6.4, 11.6.3,
11.6.2, 11.6.1



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Creating Custom Classifications

Overview: Creating custom classifications

The Policy Enforcement Manager™ (PEM) includes predefined classification signatures for many standard categories and applications. If the predefined signatures are not sufficient for classifying your traffic, you can create custom categories and applications. To use the custom categories and applications, you need to create iRules® to classify the traffic and act on the traffic.

Task summary

Determining and adjusting traffic classifications

The BIG-IP® system classifies many categories of traffic and specific applications within those categories. You can determine which categories and applications of traffic the system can classify, and find out information about them such as their application or category ID.

1. On the Main tab, click **Policy Enforcement > Classification**.

The **Classification** screen opens showing a list of the supported classification categories.

2. To view the applications in each category, click the **+** icon next to the category.
3. To view or edit the properties of the application or category, click the name to open its properties screen.

Tip: Here you can view the application or category ID number.

4. Adjust the properties of the application or category, if necessary.
 - In the **Description** field, you can add text to describe the application or category.
 - Set **State** to **Enabled** to use this classification, or to **Disabled** not to use it.

- For categories only, set **iRule Event** to **Enabled** if you want the system to trigger an iRule event when it recognizes traffic in this category, or set to **Disabled** if you do not.
- In the **Category** or **Application List** field, you can change which category an application is in, or which applications are in the category.

5. Click **Update** to save any changes.

Creating custom classification categories

On the BIG-IP® system, you can create customized categories for classifying traffic if the predefined categories are not sufficient for your needs. For example, if you plan to create new application types unique to your organization, you can create a category to group them together.

1. On the Main tab, click **Policy Enforcement > Classification**.

The **Classification** screen opens showing a list of the supported classification categories.

2. Click **Create**.

The New Application screen opens.

3. From the **Type** list, select **Category**.

4. In the **Name** field, type a name for the classification category.

5. In the **Description** field, type optional descriptive text for the application.

6. In the **Category ID** field, type an identifier for this category, a unique number in the range between **20480** and **24576**, inclusive.

7. For the **State** setting, select the appropriate value from the list.

- If you want the system to recognize this classification, select **Enabled**.
- If you do not need this classification, select **Disabled**.

8. In the **iRule Event** field, select the appropriate setting.

- To trigger an iRule event for this category of traffic, select **Enabled**. You can then create an iRule that performs an action on this type of traffic.
- If you do not need to trigger an iRule event for this category of traffic, select **Disabled**.

Note: *CLASSIFICATION::DETECTED is the only event that is supported.*

9. For the **Application List** setting, move applications that you want to associate with this category from the **Unknown** list to the **Selected** list.

If the applications are not listed yet, you can associate the applications with the category when you create them.

10. Click **Finished**.

You can create new application types to put into this classification category.

Creating custom classification applications

On the BIG-IP® system, you can create customized applications for classifying traffic if the predefined applications are not sufficient for your needs. You can add applications to existing categories or to customized categories that you have previously created.

1. On the Main tab, click **Policy Enforcement > Classification** .
The **Classification** screen opens showing a list of the supported classification categories.
2. Click **Create**.
The New Application screen opens.
3. From the **Type** list, select **Application**.
4. In the **Name** field, type a name for the application.
5. In the **Description** field, type optional descriptive text for the application.
6. In the **Application ID** field, type an identifier for this application, a unique number in the range between 8192 and 16383, inclusive.
7. For the **State** setting, select the appropriate value from the list.
 - If you want the system to recognize this classification, select **Enabled**.
 - If you do not need this classification, select **Disabled**.
8. From the **Category** list, select the category into which to place this application.
9. Click **Finished**.

Creating a custom URL database

You can create a customized URL database that can be used for adding custom URLs and categories.

1. On the Main tab, click **Policy Enforcement > Classification > URL > Feed List** .
The **New Feed List** screen opens.
2. In the **Name** field, type a unique name for the URL feed list.
3. In the **Description** field, type optional descriptive text for the URL feed list.
4. In the URLDB Location area, click the **Browse** button, and select the customdb file. The customdb file should be present on your machine, and is not present on the BIG-IP system.
The customdb file is a CSV file of the format. The format is: URL/IPv4 [,cat1] [,cat2]...

Note: The non-IP URL should have a IANA registered top level domain. The URL category ID should be in the form of integer and the range is 24576 to 32767.

For example, sample lines of customdb entry is:

```
weather.gov, 28678
pconline.com.cn, 28679
kannadaprabha.com, 28680
yandex.ru, 28677, 28676, 28681
pitt.edu, 28682
```

5. On the Main tab, click **Policy Enforcement > Classification > URL > Policy** .
The New Policy screen opens.
6. In the **Name** field, type a unique name for the URL category policy.
7. In the **Description** field, type optional descriptive text for the URL category policy.
8. In the Feed List area, select the feed list that you created to attach to the policy.
9. Click **Finished**.

The category lookup is done in the custom database, and the URL list is loaded into the custom database through file input. You can also perform URL categorization by looking up the server name indication (SNI) in SSL traffic.

Using iRules with classification categories and applications

If you are using custom classification categories or applications, you can use iRules® to identify the traffic for the custom classifications, or you can initiate an action based on how the traffic is classified.

1. On the Main tab, click **Local Traffic > iRules** .
2. Click **Create**.
3. In the **Name** field, type a 1- to 31-character name.
4. In the **Definition** field, type the syntax for the iRule using Tool Command Language (Tcl) syntax.
For example, to classify traffic as xxx_app, a custom classification application that you created, you can use this iRule:

```
when HTTP_REQUEST {
    if { [HTTP::header "Host"] contains "xxx" } {
        CLASSIFY::application set xxx_app
    }
}
```

For example, to perform an action (in this case, drop) on traffic classified as xxx_app, you can use this iRule:

```
when CLASSIFICATION_DETECTED {
    if { [CLASSIFICATION::APP == "xxx_app"]} {
        drop
    }
}
```

For complete and detailed information about iRules syntax, see the F5 Networks DevCentral web site <http://devcentral.f5.com>.

5. Click **Finished**.

After creating the iRules, you must assign them as resources for each relevant virtual server on the BIG-IP® system.

Modifying iRule event for URL categories

On the BIG-IP® system, you can modify iRules® Event settings for URL categories.

1. On the Main tab, click **Policy Enforcement > Classification**.

The **Classification** screen opens showing a list of the supported classification categories.

2. Select an URL category.

The URL Properties screen opens.

3. In the **Description** field, type optional descriptive text for the application.

4. In the **iRule Event** field, select the appropriate setting.

- To trigger an iRule event for this category of traffic, select **Enabled**. You can then create an iRule that performs an action on this type of traffic.
- If you do not need to trigger an iRule event for this category of traffic, select **Disabled**.

Note: *CLASSIFICATION::DETECTED is the only event that is supported.*

You have modified an iRule event setting for an existing URL category.

Classification iRule commands

When the BIG-IP® system identifies a specific type of traffic with iRules® enabled, it triggers a CLASSIFICATION_DETECTED event. You can use the commands within iRules for additional system flexibility to classify the flow as one or more of the application or category classifications. The CLASSIFY commands are available from the HTTP_REQUEST or HTTP_RESPONSE iRule events.

iRule Command	Description
CLASSIFICATION::app	Gets the name of the classified application (the most explicit classified application).
CLASSIFICATION::category	Gets the category of the application.
CLASSIFICATION::disable	Disables the classification for a flow.
CLASSIFICATION::enable	Enables the classification for a flow.
CLASSIFICATION::protocol	Gets the name of the classified protocol (the least explicit classified application).
CLASSIFY::application set appname	Classifies the flow as appname and associates the category that appname belongs to.
CLASSIFY::application set appname	Classifies the flow as appname and associates the category that appname belongs to.

iRule Command	Description
CLASSIFY::category set <i>catname</i>	Classifies the flow as <i>catname</i> and also associates the flow with the unknown category.
CLASSIFY::application add <i>appname</i>	Adds the application <i>appname</i> to the classification statistics.
CLASSIFY::category add <i>catname</i>	Adds the category <i>catname</i> to the classification statistics.